EXHIBIT B

Bay Area to Central Valley High-Speed Train

CEQA Mitigation, Monitoring, and Reporting Plan

Adopted by Resolution No. HSRA 11-11

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CALIFORNIA
High-Speed Rail Authority

MITIGATION, MONITORING, AND REPORTING PLAN: BAY AREA TO CENTRAL VALLEY HIGH-SPEED TRAIN REVISED FINAL PROGRAM EIR

This mitigation, monitoring, and reporting plan is designed to fulfill Section 21081.6 of the California Environmental Quality Act (CEQA), which requires public agencies to adopt a reporting or monitoring program whenever a project or program is approved that includes mitigation measures identified in an environmental document. The mitigation strategies described below are for a program-level decision and are to be used to avoid, minimize, or reduce any potentially significant environmental impacts. Project-level activities will undergo future environmental analysis as required by NEPA and CEQA tiering from this Revised Final Program EIR (including the 2008 Final Program EIR). As part of these second-tier environmental reviews, the lead agency for each of these projects will use the mitigation strategies identified in the program document as starting points to determine their applicability to a specific project and to develop additional mitigation measures for significant adverse impacts identified in the project-specific analysis. Because all the potential actions and impacts for tiered projects cannot be anticipated at a programmatic level, each project needs to select those strategies applicable to the impacts associated with the specific location and type of action. For purposes of CEQA, the mitigation strategies in the Revised Final Program EIR also serve as mitigation measures at a programmatic level. The NEPA/CEQA monitoring process includes review, guidance, and reporting components. The lead agencies for second tier documents will note which applicable programmatic mitigation strategies are being adopted and used for mitigation measures and explain why others are not. The lead agencies will provide a schedule for implementing the adopted mitigation measures and for reviewing the implementation of those measures.

As a programmatic-level document, the Revised Final Program EIR (including the 2008 Final Program EIR) does not analyze site-specific impacts of potential alignments or stations; therefore, it cannot predict with certainty which impacts will occur and what site-specific mitigation measures are appropriate for the second-tier level of actions. Consequently, the Revised Final Program EIR (including the 2008 Final Program EIR) describes mitigation strategies that are approaches tailored to address the types of impacts anticipated as a result of construction of the HST system. These strategies will provide the basis to structure more site-specific measures when more detailed data on the impacts is available at the second-tier. In addition, the Authority has committed to design practices and policies that will be used to develop alignment alternatives at the project-level to avoid impacts and to help shape specific mitigation measures.

At this program level of planning, the Authority is responsible for tracking the mitigation and incorporating it into future studies that it undertakes, but a monitoring plan cannot yet be developed. For the next tiers of environmental analysis, a monitoring plan will be developed as part of each project-level analysis that includes more specific timing for the mitigation measures, and additional parties may be identified with responsibility for implementing the measures.

Resource Area	Impact Area	Mitigation Measure
Traffic and Circulation	Traffic and circulation	Require that HST system stations serve as multi-modal transportation hubs providing easy connection to local/regional bus, rail and transit services, as well as providing bicycle and pedestrian access.
		Require the HST system to be grade-separated from all roadways to allow vehicular traffic to flow without impediment from the HST system.
		Work with local and regional agencies to develop and implement transit-oriented development strategies, as described in Chapter 6, around HST stations.
		Work with local and regional agencies to identify, plan, coordinate, and implement traffic flow improvements around HST station locations during project-level planning. Such improvements may include: a. construction phasing and traffic management plan for construction periods b. minimizing closure of any proximate freight or passenger rail line or highway facility during construction c. widening of roadways d. installation of new traffic signals e. improving capacity of local streets with upgrades in geometrics such as providing standard roadway lane widths, traffic controls, bicycle lanes, shoulders and sidewalks f. modifications at intersections, such as signalization and/or capacity improvements (widening for additional left-turn and/or through lanes), and turn prohibitions g. signal coordination and optimization (including retiming and rephasing) h. designation of one-way street patterns near some station locations i. truck route designations j. coordinate with Caltrans regarding nearby highway facilities
		Work with public transportation providers to coordinate services and to increase service and/or add routes, as necessary, to serve the HST station areas.
		Use one-way streets and traffic diversion to alternate routes. Additional regional strategies include: a. coordination with regional transportation (highway and transit) planning (e.g., regional transportation plans b. congestion management plans c. freeway deficiency plans d. Intelligent Transportation Systems Strategies (ITS)

Resource Area	Impact Area	Mitigation Measure
		Require a Transportation Impact Analysis be prepared for the degradation of level of service for three northbound segments (between Southside Drive and Senter and between Blossom Hill and Bernal) of a four-lane Monterey Highway between Southside Drive and Bailey Road at the project-level to evaluate specific impacts and identify mitigation measures. At the program level, mitigation strategies may include: a. optimizing signal timings (for the revised traffic volumes and capacity) b. synchronizing signals (Coordinating the timing of the signals between successive intersections, and automatically adjusting the traffic signals to facilitate the movement of vehicles through the intersections. This will help in reducing overall stops and delays. This works well if the distance between adjacent signals is a quarter of a mile or less). c. selectively adding new turn lanes at intersections. (For example, adding two left-turn lanes instead of an existing single left-turn lane. The traffic analysis will show which intersections would require additional turn lanes. Adding turn lanes would be much more economical/affordable than adding whole lanes.) d. promoting more transit usage in the corridor by increasing frequency of popular transit services.
	Parking	Avoid parking impacts by developing and coordinating implementation at the project-level of parking improvement strategies consistent with local policies, including shared parking, off-site parking with shuttles, parking and curbside use restrictions, parking permit plans for neighborhoods near HST stations, and other parking management strategies.
Air Quality	Localized air quality impacts due to congestion/traffic near HST stations	Assure that HST stations are multi-modal hubs and include appropriate parking, including increased parking for carpools, bicycles, and other alternative transportation methods.
		Coordinate with local and regional public transportation providers to increase opportunities for connection between the HST system and other public transportation services.
		Increase use of alternative-fueled vehicles.
		Work with local and regional agencies to implement local street and roadway improvements, including various traffic flow improvements and congestion management techniques, and parking management strategies to reduce localized pollution from traffic related to the HST system.
	Short-term air quality impacts due to construction	Water all active construction areas at least twice daily.
		Require that all trucks hauling soil, sand, and other loose materials be covered or maintain at least two feet of freeboard.
		Pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas and staging areas at active construction sites.
		Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at active construction sites.
		Sweep nearby streets daily (with water sweepers) if visible soil materials from HST system construction are carried onto adjacent public streets.
		Hydroseed or apply non-toxic soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
		Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles of dirt, sand, etc.
		Limit traffic speeds on unpaved roads to 15 mph

Resource Area	Impact Area	Mitigation Measure
		Install sand bags or other erosion control measures to prevent silt runoff to public roads.
		Replant vegetation in disturbed areas as quickly as possible.
		Use alternative fuels for construction equipment when feasible.
		Minimize equipment idling time.
		Maintain properly tuned equipment.
Noise and Vibration	Increased noise from train operations and construction	Grade separations to eliminate grade crossing related noise.
		Noise barriers, such as sound walls, where there are severe noise impacts.
		Require noise reduction in HST equipment design and track structures design.
		Use of enclosures or walls to surround noisy equipment, and installation of mufflers on engines; substitution of quieter equipment or construction methods, minimizing time of operation and locate equipment farther from sensitive receptors.
		Where not already included, consider placing alignment sections in tunnel or trenches or behind berms where possible and where other measures are not available to reduce significant noise impacts.
		Suspend construction between 7:00 pm and 7:00 am and/or on weekends or holidays in residential areas where there are severe noise impacts.
		In managing construction noise take into account local sound control and noise level rules, regulations and ordinances.
		Ensure that each internal combustion engine would be equipped with a muffler of a type recommended by the manufacturer.
		Specify the use of the quietest available construction equipment where appropriate and feasible.
		Turn off construction equipment during prolonged periods of non-use.
		Require contractors to maintain all equipment and to train their equipment operators.
		Locate noisy stationary equipment away from noise sensitive receptors.
	Exposure to ground-borne vibration	Specify the use of train and track technologies that minimize ground vibration such as state of the art suspensions, resilient track pads, tie pads, ballast mats or floating slabs.
		Phase construction activity, use low impact construction techniques and avoid use of vibrating construction equipment where possible to avoid vibration construction impacts.
Energy	Increased energy use and electricity demand with the HST system	HST stations will be multi-modal hubs providing linkage for various transportation modes, which will contribute to increased efficiency of energy use for intercity trips and by commuters, and the stations will be required to be constructed to meet Title 24 California Code of Regulations energy efficiency standards.
		Design practices will require that the electrically powered HST technology be energy efficient, include regenerative braking to reduce energy consumption, and minimize grade changes in steep terrain to reduce energy consumption
		Design practices will require that localized impacts be avoided through planning and design of the power distribution system for the HST System.
	Energy use during construction of the HST system	Develop and implement a construction energy conservation plan.
		Use energy efficient construction equipment and vehicles.
		Locate construction material production facilities on-site or in proximity to project construction sites.

Resource Area	Impact Area	Mitigation Measure
		Develop and implement a program encouraging construction workers to carpool or use public transportation for travel to and from construction sites.
		Develop potential measures to reduce energy consumption during operation and maintenance activities.
Electromagnetic Fields and Electromag-netic Interference	Exposure of electromagnetic fields to HST system workers, passengers, and nearby residents, schools and other facilities	Use standard design practices for overhead catenary power supply systems and vehicles, including appropriate materials, location and spacing of facilities and power supply systems to minimize exposure to receptors over distance, and shielding with vegetation and other screening materials.
		Design overhead catenary system, substations, and transmission lines to reduce the electromagnetic fields to a practical minimum.
	Electromagnetic interference with electronic and electrical devices	Design the overhead catenary system, substations, and transmission lines to reduce the electromagnetic fields to a practical minimum.
		Design the project component to minimize arcing and radiation of radiofrequency energy.
		Choose devices generating radiofrequency with a high degree of electromagnetic compatibility.
		Where appropriate, add electronic filters to attenuate radiofrequency interference.
		Relocate receiving antennas and use antenna models with greater directional gain where appropriate, particularly for sensitive receptors near the HST system.
		Comply with the FCC regulations for intentional radiators, such as the proposed HST wireless systems.
		Establish safety criteria and procedures and personnel practices to avoid exposing employees with implantable medical devices to EMF levels that may cause interference with such implanted biomedical devices.
Land Use	Long-term land use compatibility impacts with HST operations	Continue to apply design practices to minimize property needed for the HST system and to stay within or adjacent to existing transportation corridors to the extent feasible.
		Work with local governments to consider local plans and local access needs, and to apply design practices to limit disruption to communities. Access may need to be modified, including possible over or undercrossings, where land acquisition results in a division of a farm or other land use.
		The Authority will seek agreements with freight rail operators (UP and/or BNSF) to utilize portions of the existing rail right-of-way to the greatest feasible extent.
		Work with local governments to enhance multi-modal connections for HST stations.
		Coordinate with cities and counties to ensure that HST facilities would be consistent with land use planning processes and zoning ordinances.
		Provide opportunities for community involvement early in project-level studies.
		Hold design workshops in affected neighborhoods to develop understanding of vehicle, bicycle, and pedestrian linkages in order to preserve those linkages through use of grade-separated crossings and other measures.
		Ensure that connectivity is maintained across the rail corridor (pedestrian/bicycle and vehicular crossings) where necessary to maintain neighborhood integrity.
		Develop facility, landscape and public art design standards for HST corridors that reflect the character of adjacent affected neighborhoods.

Resource Area	Impact Area	Mitigation Measure
		Maintain high level of visual quality of HST facilities in neighborhood areas by implementing such measures as visual buffers, trees and other landscaping, architectural design and public artwork.
		Work with local governments to establish requirements for station area plans and opportunities for transit-oriented development. Local governments would play a significant role in implementing station area development by adopting plans, policies, zoning provisions, and incentives for higher densities, and by approving a mix of urban land uses. Station area TOD development principles to be applied at the project level for each HST Station include higher density development, mix of land uses, pedestrian-oriented design, context-sensitive building design, and parking limits and preferences.
		Select station locations that are multi-modal transportation hubs with a preference for traditional city centers.
		Adopt HST station area development policies and principles that require TOD, and promote value-capture at and around station areas as a condition for selecting a HST station site.
		Provide incentives for local governments where potential HST stations may be located to prepare and adopt Station Area Plans and to amend City and County General Plans that incorporate station area development principles in the vicinity of HST stations.
		Give priority to stations for which the city and/or county has adopted station area TOD plans and general plans that focus and prioritize development on the TOD areas rather than on auto-oriented outlying areas.
		The Authority will undertake a comprehensive economic study in the Central Valley of the kinds of businesses that would uniquely benefit from being located near HST station areas, including an estimate of the kinds and numbers of jobs that such businesses would create.
		The Authority will work with local governments, interested agencies and organizations, and provide funding and technical support, along with other partners, to build upon blueprint processes, to focus on supporting downtowns and increasing transit ridership, to increase development densities in the vicinity of HST station areas, and to assist in developing a vision with local partners as to how HST can encourage further in-fill development in Central Valley cities and support environmentally and economically sustainable future growth.
	Short-term land use compatibility impacts from HST construction	Develop a traffic management plan to reduce barrier effects during construction.
		To the extent feasible maintain connectivity during construction.
Agricultural Lands	Conversion of prime, statewide important, and unique farmlands, and farmlands of local importance, to project uses	Avoid farmland whenever feasible during the conceptual design stage of the project.
		Reduce the potential for impacts by sharing existing rail rights-of-way where feasible or by aligning HST features immediately adjacent to existing rail rights-of-way.
		Reduce the potential for impacts by reducing the HST right-of-way width to 50 feet in constrained areas.
		Coordinate with private agricultural land trusts, local programs, mitigation banks, and Resource Conservation Districts to identify additional measures to limit important farmland conversion or provide further protection to existing important farmland.

Resource Area	Impact Area	Mitigation Measure
		The Authority, or other entities designated and supported by the Authority will acquire, from willing sellers, agricultural conservation easements encompassing at least 3,500 acres of important farmland (as defined by the FMMP). The eventual locations and total acreage for these easements would be determined in consultation with the California Department of Conservation, and others, and in conjunction with project-level decisions of the HST system.
	Severance of prime, statewide important, and unique farmlands, and farmlands of local importance, to project uses	Avoid farmland whenever feasible during the conceptual design stage of the project
		Minimize severance of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access
		Work with landowners during final design of the system to enable adequate property access
		Provide appropriate severance payments to landowners.
Aesthetics and Visual Resources	Long-term visual quality impacts due to operation	At the project-level, design proposed facilities that are attractive in their own right and that would integrate well into landscape contexts, so as to reduce potential view blockage, contrast with existing landscape settings, light and shadow effects, and other potential visual impacts.
		Design bridges and elevated guideways with graceful lines and minimal apparent bulk and shading effects.
		Design elevated guideways, stations, and parking structures with sensitivity to the context, using exterior materials, colors, textures, and design details that are compatible with patterns in the surrounding natural and built environment, and that minimize the contrast of the structures with their surroundings.
		Use neutral colors and dulled finishes that minimize reflectivity for catenary support structures, and design them to fit the context of the specific locale.
		Use aesthetically appropriate fencing along rights-of-way, including decorative fencing, where appropriate, and use dark and non-reflective colors for fencing to reduce visual contrast.
		Where at-grade or depressed route segments pass through or along the edge of residential areas or heavily traveled roadways, install landscape treatments along the edge of the right-of-way to provide partial screening and to visually integrate the right-of-way into the residential context.
		Use the minimum amount of night lighting consistent with that necessary for operations and safety.
		Use shielded and hooded outdoor lighting directed to the area where the lighting is required, and use sensors and timers for lights not required to be on all the time.
		Design stations to minimize potential shadow impacts on adjacent pedestrian areas, parks, and residential areas, and site all structures in a way that minimizes shadow effects on sensitive portions of the surrounding area.
		Seed and plant areas outside the operating rail trackbed that are disturbed by cut, fill or grading to blend with surrounding vegetated areas, where the land will support plants. Use native vegetation in appropriate locations and densities.
		Use strategic plantings of fast-growing trees to provide partial or full screening of elevated guideways where they are close to residential areas, parks, and public open spaces.
		Where elevated guideways are located down the median strips or along the edge of freeways or major roadways, use appropriate landscaping of the area under the guideway to provide a high level of visual interest. Landscaping in these area should use attractive shrubs and groundcovers, and emphasize the use of low-growing species to minimize any additional shadow effects or blockage of views.

Resource Area	Impact Area	Mitigation Measure
		Plan hours of construction operations and locate staging sites to minimize impacts to adjacent residents and businesses.
		Screen construction sites, as appropriate, to minimize visual construction impacts.
	Short-term visual quality impacts due to construction	Plan hours of construction operations and locate staging sites to minimize impacts to adjacent residents and businesses.
		Screen construction sites, as appropriate, to minimize visual construction impacts.
Public Utilities		Make adjustments to the HST system alignments and vertical profiles to avoid crossing or using major utility right-of-way or fixed facilities during engineering design.
		If avoidance is not feasible, in consultation and coordination with the utility owner, relocate or protect in place transmission lines, substations, and any other affected facilities.
		For acquisition projects which result in utility relocation, follow the uniformity and equitable treatment policies, and comply with the requirements, of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 for all property necessary for the proposed HST system.
Hazardous Materials and Wastes		Investigate soils and groundwater for contamination and prepare environmental site assessments when necessary and consult with Department of Toxic Substance Control (DTSC) and California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) about sites of concern.
		Design realignment of the HST corridors to avoid identified sites.
		Relocate HST associated facilities such as stations to avoid identified sites.
		Remediate identified hazardous materials and hazardous waste contamination.
		Prior to demolition of buildings for project construction, survey for lead-based paint and asbestos-containing materials.
		Follow BMP's for testing, treating, and disposing of water, and acquire necessary permits from the regional water quality control board, if ground dewatering is required.
		When indicated by project level environmental site assessments, perform Phase II environmental site assessments in conformance with the ASTM Standards related to the Phase II Environmental Site Assessment Process to identify specific mitigation measures.
		Prepare a Site Management Program/Contingency Plan prior to construction to address known and potential hazardous material issues, including a. Measures to address management of contaminated soil and groundwater; b. Site-specific Health and Safety Plan (HASP), including measures to protect construction workers and general public; and c. Procedures to protect workers and the general public in the event that unknown contamination or buried hazards are encountered.
		As part of the second-tier environmental review, consider impacts to the environment on sites identified on the Cortese list (Government Code section 65962.4) at that time.
Cultural and Paleontological Resources	Impacts to archaeological resources and traditional cultural	Avoid the impact, or when avoidance cannot be accommodated, minimize the scale of the impact.
		Incorporate the site into parks or open space.
		Cap or cover the site before construction.

Resource Area	Impact Area	Mitigation Measure
	properties	Provide data recovery for the archaeological resources, which may include excavation of an adequate sample of the site contents so that research questions applicable to the site can be addressed.
		Develop procedures for fieldwork, identification, evaluation, and determination of potential effects to archaeological resources in consultation with SHPO and Native American tribes. Procedures may include on-site monitoring when sites are known or suspected of containing Native American human remains and be reflected in Memoranda of Agreement with appropriate bodies.
		Coordinate and consult with tribal representatives.
	Impacts to historic properties/ resources	Avoid the impact through project design. Prepare and utilize a treatment plan for protection of historic properties/resources that would describe methods to preserve, stabilize, shore/underpin, and monitor buildings, structures, and objects.
		Avoid high vibration construction techniques in sensitive areas.
		Record and document cultural resources that would be adversely affected by the project to the standards of the Historic American Building Survey or Historic American Engineering Record.
		Develop design guidelines to ensure sympathetic, compatible, and appropriate designs for new construction.
		Consult with architectural historians or historical architects to advise on appropriate architectural treatment of the structural design of proposed new structures. Prepare interpretive and/or educational materials and programs regarding the affected historic properties/resources. Materials may include: a popular report, documentary videos, booklets, and interpretive signage.
		Make interpretive information available to state and local agencies, such as salvage items, historic drawings, interpretive drawings, current and historic photographs, models, and oral histories. Also assist with archiving and digitizing the documentation of the cultural resources affected, and disseminating material to the appropriate repositories.
		Relocate and rehabilitate historic properties/resources that would otherwise be demolished because of the project.
		Monitor project construction to ensure it conforms to design guidelines and any other treatment procedures agreed to by the parties consulting pursuant to Section 106 of the National Historic Preservation Act. Repair inadvertent damage to historic properties/resources in accordance with the Secretary of the Interior's Standards for Treatment of Historic Properties.
		Salvage selected decorative or architectural elements of the adversely affected historic properties/resources, and retain and incorporate salvaged items into new construction where possible. If reuse is not possible, make salvaged items available for use in interpretive displays near the affected resources or in an appropriate museum.
		Implement an agreement with appropriate bodies specifying procedures for addressing historic resources which may be affected by the HST system.
		Evaluate the Keeling Shade Trees to determine if the resource is eligible for listing on the National Register of Historic Places. If eligible, determine whether the project would have an adverse effect under Section 106. If an adverse effect occurs, avoid the trees through project design or fill in existing gaps where specimens have died or are dying to offset removal of specimens by the project.
	Impacts to paleontological	Educate workers.
		Recover fossils identified during the field reconnaissance.

Resource Area	Impact Area	Mitigation Measure
	resources	Monitor construction.
		Develop protocols for handling fossils discovered during construction, such as temporary diversion of construction equipment so that the fossils could be recovered, identified, and prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.
Geology and Soils	Seismic hazards	Design structures to withstand anticipated ground motion, using design options such as redundancy and ductility.
		Prevent liquefaction and resulting structural damage and traffic hazards using: (1) ground modification techniques such as soil densification; and (2) structural design, such as deep foundations.
		Utilize motion sensing instruments to provide ground motion data and a control system to temporarily shut down HST operations during or after an earthquake to reduce risks.
		Design and engineer all structures for earthquake activity using Caltrans Seismic design Criteria.
		Design and install foundations resistant to soil liquefaction and settlement.
		Identify potential serpentinite bedrock disturbance areas and implement a safety plan.
		Apply Section 19 requirements from the most current Caltrans Standard Specifications to ensure geotechnically stable slopes are planned and created.
		Install passive or active gas venting systems and gas collection systems in areas where subsurface gases are identified.
		Remove corrosive soil and use corrosion protected materials in infrastructure.
		Address erosive soils through soil removal and replacement, geosynthetics, vegetation, and or rip/rap, where warranted.
		Remove or moisture condition shrink/swell soils.
		Utilize stone columns, grouting, and deep dynamic compaction in areas of potential liquefaction.
		Utilize buttress berms, flattened slopes, drains, and/or tie-backs in areas of slope instability.
		Avoid settlement through preloading, use of stone columns, deep dynamic compaction, grouting, and/or special foundation designs.
	Surface rupture hazards	Install early warning systems triggered by strong ground motion associated with ground rupture, such as linear monitoring systems (i.e., time domain reflectometers) along major highways and rail lines within the zone of potential rupture to provide early warnings and allow for temporary control of rail and automobile traffic to avoid and reduce risks.
		Continue to modify alignments to avoid crossing known or mapped active faults within tunnels.
		Avoid active faults to the extent possible. Where avoidance is not possible, cross active faults at grade and perpendicular to the fault line.
	Slope instability	Install temporary and permanent slope reinforcement and protection, based on geotechnical investigations, and review of proposed earthwork and foundation excavation plans.
		Conduct geotechnical inspections during construction to verify that no new, unanticipated conditions are encountered.
		Incorporate slope monitoring in final design.

Resource Area	Impact Area	Mitigation Measure
	Difficulty in excavation	Identify areas of potentially difficult excavation to ensure safe practices.
		Focus future geotechnical engineering and geologic investigations in areas of potentially difficult excavation.
		Monitor conditions during and after construction.
		Employ tunnel excavation and lining techniques to ensure safety.
	Hazards related to oil and gas fields	Follow federal and state Occupational Safety and Health Administration regulatory requirements for excavations.
		Consult with other agencies such as the Department of Conservation's Division of Oil and Gas, or the Department of Toxic Substances Control regarding known areas of concern.
		Use safe and explosion-proof equipment during construction.
		Test for gases regularly.
		Install monitoring systems and alarms in underground construction areas and facilities where subsurface gases are present.
		Install gas barrier systems.
Hydrology and Water Resources	Impacts on floodplains	Avoid or minimize construction of facilities within floodplains where feasible.
		Construct appropriately sized culverts under the trackway to convey anticipated storm flows and to minimize ponding.
		Minimize the footprint of facilities within the floodplain, through design changes or the use of aerial structures and tunnels.
		Restore the floodplain to its prior operation in instances where the floodplain is impacted by construction.
	Impacts on surface waters	Use construction methods and facility designs to minimize the potential encroachments onto surface water resources.
		Minimize sediment transport caused by construction by following best management practices (BMPs) as part of National Pollutant Discharge Elimination System (NPDES) and Storm Water Pollution Prevention Plan requirements that will be included in construction permits. BMPs may include measures such as: a. providing permeable surfaces where feasible; b. retaining and treating stormwater onsite using catch basins and filtering wet basins; c. minimizing the contact of construction materials, equipment, and maintenance supplies with stormwater; d. reducing erosion through soil stabilization, watering for dust control, installing perimeter silt fences, placing rice straw bales, and installing sediment basins; e. maintaining water quality by using infiltration systems, detention systems, retention systems, constructed wetland systems, filtration systems, biofiltration/bioretention systems, grass buffer strips, ponding areas, organic mulch layers, planting soil beds, sand beds, and vegetated systems such as swales and grass filter strips that are designed to convey and treat either fallow flow (swales) or sheetflow (filter strips) runoff.
		Use methods such as habitat restoration, reconstruction of [habitat] onsite, and habitat replacement offsite to minimize surface water quality impacts.
		Comply with mitigation measures included in permits issued under Sections 404 and 401 of the federal Clean Water Act.

Resource Area	Impact Area	Mitigation Measure
		Comply with requirements in the Storm Water Pollution Prevention Plan to reduce pollutants in storm water discharges and the potential for erosion and sedimentation.
		Comply with requirements of Section 10 of the federal Rivers and Harbors Act for work required around a water body designated as navigable and applicable permit requirements.
		Comply with the requirements of a state Streambed Alteration Agreement for work along the banks of various surface water bodies.
		Implement a spill prevention and emergency response plan to handle potential fuel or other spills.
		Where feasible, avoid significant development of facilities in areas that may have substantial erosion risk, including areas with erosive soils or steep slopes.
	Impacts on groundwater	Minimize development of facilities in areas that may have substantial groundwater discharge or affect recharge.
		Apply for, obtain, and comply with conditions of applicable waste discharge requirements as part of project-level review.
		Develop facility designs that are elevated, or at a minimum are permeable, and would not affect recharge potential where construction is required in areas of potentially substantial groundwater discharge or recharge.
		Apply for and obtain a Storm Water Pollution Prevention Plan for grading, with Best Management Practices that would control release of contaminants nears areas of surface water or groundwater recharge. Best Management Practices may include constraining fueling and other sensitive activities to alternative locations, providing drip plans under some equipment, and providing daily checks of vehicle condition.
		Use and retain native materials with high infiltration potential at the ground surface in areas that are critical to infiltration for groundwater recharge.
Biological Resources and Wetlands	Impacts to sensitive habitat and vegetation communities	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Use large diameter tunnels as part of the design to limit surface access needs in tunnels for ventilation or evacuation, as a method to avoid or limit impacts to vegetation and habitat above tunnels.
		Use in-line construction (i.e., use new rail infrastructure as it is built) in ecological sensitive areas to transport equipment to/from the construction site and to transport excavated material away from the construction to appropriate re-use or disposal sites to minimize impacts from construction access roads on vegetation/habitat.
		Accomplish necessary geologic exploration in sensitive areas by using helicopters to transport drilling equipment and for site restoration to minimize surface disruption.
		Use and reuse excavated materials within the confines of the project.
		Participate in or contribute to existing or proposed conservation banks or natural management areas, including possible acquisition, preservation, or restoration of habitats.
		Revegetate/restore impacted areas, with a preference for on-site mitigation over off-site, and with a preference for off-site mitigation within the same watershed or in close proximity to the impact where feasible.
		Comply with the Biological Resources Management Plan(s) developed or identified during project-level studies, as reviewed by the USFWS, CDFG, and USACE.
		Conduct pre-construction focused biological surveys.

Resource Area	Impact Area	Mitigation Measure
		Conduct biological construction monitoring.
		Undertake plant relocation, seed collection, plant propagation, and outplanting at suitable mitigation sites.
		Prevent the spread of weeds and invasive species during construction and operation by identifying areas with existing weed problems and measures to control traffic moving out of those areas such as cleaning construction vehicles or limiting the movement of fill.
	Impacts to wildlife movement corridors	Construct species specific appropriately sized wildlife underpasses, bridges, and/or large culverts, to facilitate known wildlife movement corridors.
		Ensure that wildlife crossings are of a design, shape, and size to be sufficiently attractive to encourage wildlife use.
		Provide appropriate vegetation to wildlife overcrossings and undercrossings to afford cover and other species requirements.
		Establish functional corridors to provide connectivity to protected land zoned for uses that provide wildlife permeability.
		Design protective measures for wildlife movement corridors using the following process in consultation with resource agencies: a. Identify the habitat areas the corridor is designed to connect b. Select several species of interest from the species present in the area c. Evaluate the relevant needs of each selected species d. For each potential corridor, evaluate how the area will accommodate movement by each species of interest e. Draw the corridors on a map f. Design a monitoring program
		Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Use aerial structures or tunnels to allow for unhindered crossing by wildlife.
	Impacts to non-wetland jurisdictional waters	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Return degraded habitat to pre-existing conditions.
		Create new habitat by converting non-wetland habitats into wetland or other aquatic habitat.
		Enhance existing habitats by increasing one or more functions through activities such as plantings or non-native vegetation eradication.
		Provide for passive revegetation by allowing a disturbed area to revegetate naturally.
		Purchase credits in an existing wetlands or aquatic habitat mitigation bank.
		Provide in-lieu fee payments to an agency or other entity who will provide aquatic habitat conservation or restoration.
		Prefer on-site mitigation over off-site mitigation, and for off-site mitigation prefer that located within the same watershed or as close in proximity to the area of impact as possible.
	Impacts to wetlands	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Return degraded habitat to pre-existing conditions.
		Create new habitat by converting non-wetland habitats into wetland or other aquatic habitat.

Resource Area	Impact Area	Mitigation Measure
		Enhance existing habitats by increasing one or more functions through activities such as plantings or non-native vegetation eradication.
		Provide for passive revegetation by allowing a disturbed area to revegetate naturally.
		Purchase credits in an existing wetlands or aquatic habitat mitigation bank.
		Provide in-lieu fee payments to an agency or other entity who will provide aquatic habitat conservation or restoration.
		Develop and implement measures to address the “no net loss” policy for wetlands.
		Prefer on-site mitigation over off-site mitigation, and for off-site mitigation prefer that located within the same watershed or as close in proximity to the area of impact as possible.
	Impacts to marine and anadromous fishery resources	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Comply with the terms of a Streambed Alteration Agreement for work along banks of surface water bodies.
		Implement a spill prevention and emergency response plan to handle potential fuel or other spills.
		Incorporate bio-filtration swales to intercept runoff.
		Where feasible, avoid significant development of facilities in areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
	Impacts to special status species	Utilize existing transportation corridors and rail lines to minimize potential impacts.
		Relocate sensitive species.
		Conduct seed collection and plant propagation for sensitive plant species.
		Conduct pre-construction focused surveys.
		Conduct biological construction monitoring.
		Restore suitable breeding and foraging habitat.
		Purchase credits from an existing mitigation bank.
		Participate in an existing Habitat Conservation Plan.
		Phase construction around the breeding season.
	Impacts to protected habitats and conservation areas	Conduct focused surveys of biological resources within areas of the GEA directly affected by HST tracks and faculties, including sensitive habitats, and special-status plant and wildlife species.
		Conduct project-level evaluation of biological resources in the GEA to determined impacts from construction, operation, and maintenance, including, but not limited to, ecosystem fragmentation impacts, impacts to wildlife movement corridors, impacts to waterfowl flight patterns, noise impacts, startle and vibration impacts, collision impacts, electrocution impacts, glare impacts, water quality and water flow impacts, impacts on waterfowl nesting breeding, impacts on migratory habits, impacts from construction traffic, impacts of equipment storage and laydown areas, impacts from blasting and pile-driving, and impacts from temporary disruption of water supply deliveries.
		Minimize the footprint of necessary HST facilities to the extent feasible in the HST alignment crossing the GEA.
		The Authority commits to construct an elevated structure along an approximate three-mile portion of Henry Miller Road to minimize impacts on sensitive areas, including wetlands and habitat.

Resource Area	Impact Area	Mitigation Measure
		Consult with the CDFG, the USFWS, and Grassland Water District, in evaluating the timing of construction activities within the GEA and in developing measures to minimize disturbance during nesting and flooding seasons.
		Consult with CDFG, USFWS, and the Grassland Water District, on non-glare and directed lighting and appropriate measures to avoid disturbance impacts to sensitive species in areas of the GEA directly affected by proposed HST facilities.
		The Authority, or other entities designated and supported by the Authority will acquire, from willing sellers, agricultural, conservation and/or open space easements encompassing at least 10,000 acres and generally located along or in the vicinity of the HST alignment and within or adjacent to the designated GEA. The focus for these easements will be in areas undergoing development pressures, such as the areas around Los Banos and Volta, and/or areas that would be most appropriate for ecological conservation or restoration. The eventual locations and total acreage for these easements would be determined in consultation with the CDFG, the USFWS, and the Grassland Water District and in conjunction with project-level decisions addressing the Gilroy to Merced portion of the HST system.
Public Parks and Recreation Resources	Impacts to parks and recreational resources	Continue to apply design practices to avoid impacts to park resources, and when avoidance cannot be accommodated, minimize the scale of the impact
		Apply measures at the project level to reduce and minimize indirect/proximity impacts as appropriate for the particular sites affected, while avoiding other adverse impacts (e.g., visual), such as noise barriers, visual buffers and landscaping.
		Apply measures to modify access to/egress from the recreational resource to reduce impacts to these resources.
		Design and construct cuts, fill, and aerial structures to avoid and minimize visual impacts to units of the state park system.
		Incorporate wildlife under or over crossings at appropriate intervals as necessary.
		Where public parklands acquired with public funds would be acquired for non-park use as part of the HST system, commit as required by law to providing funds for the acquisition of substantially equivalent substitute parkland or to acquiring/providing substitute parkland of comparable characteristics for construction impacts.
		Restore affected park lands to natural state and replace or restore affected park facilities.
		If park facilities must be relocated, provide planning studies as well as appropriate design and replacement with minimal impact on park use.
		Use local native plants for revegetation.
		Develop and implement construction practices, including scheduling, to limit impacts to wildlife, wildlife corridors and visitor use areas within public parks.
		For temporary unavoidable loss of park and recreation facility uses consider providing compensation.
Union Pacific Railroad (UPRR) Freight Operations	Impacts on UPRR freight operations	Construct grade separation in the form of an HST aerial flyover or underpass to preserve access to existing rail spurs and branch lines.
		Consolidate consecutive spur tracks that occur over a short distance to minimize the need for multiple grade separations.
		Relocate team tracks to the opposite side of the UPRR in locations where they conflict with HST. A team track is a small railroad siding or spur track intended for the use of area merchants, manufacturers, farmers and other small businesses to personally load and unload products and merchandise, usually in smaller quantities.

Resource Area	Impact Area	Mitigation Measure
		For silo or quarry operations, provide new loading/unloading facilities with augers and conveyors that pass over or under the HST alignment to a siding on the UPRR mainline that alleviates the need for a UPRR spur to cross the HST.
		To the extent possible, the schedule for construction will be coordinated with existing rail operators to minimize impacts to existing operations.
Cumulative	Impacts on traffic and circulation and travel conditions	See Traffic and Circulation above.
	Impacts on air quality	See Air Quality above.
	Impacts on noise and vibration	See Noise and Vibration above.
	Impacts on land use and planning, communities and neighborhoods, property, and environmental justice	See Land Use above.
	Impacts on agricultural lands	See Agricultural Lands above.
	Impacts on aesthetics and visual resources	See Aesthetics and Visual Resources above.
	Impacts on public utilities	See Public Utilities above.
	Impacts on cultural and paleontological resources	See Cultural and Paleontological Resources above.
	Impacts on geology and soils	See Geology and Soils above.
	Impacts on hydrology and water resources	See Hydrology and Water Resources above.
	Impacts on biological resources and wetlands	See Biological Resources and Wetlands above.
	Impacts on Section 4(f) and 6(f) resources (public parks and recreational resources)	See Public Parks and Recreation Resources above.

Resource Area	Impact Area	Mitigation Measure
	Impacts on UPRR freight operations	See UPRR Freight Operations above.